Native Rate Series
Native Rate Series Plus
Digital Video Processor

Installation and
Operations Manual

**FAROUDJA
PICTURE PLUS™**

A Division of Sage, Inc.

Made in USA

INSTALLATION
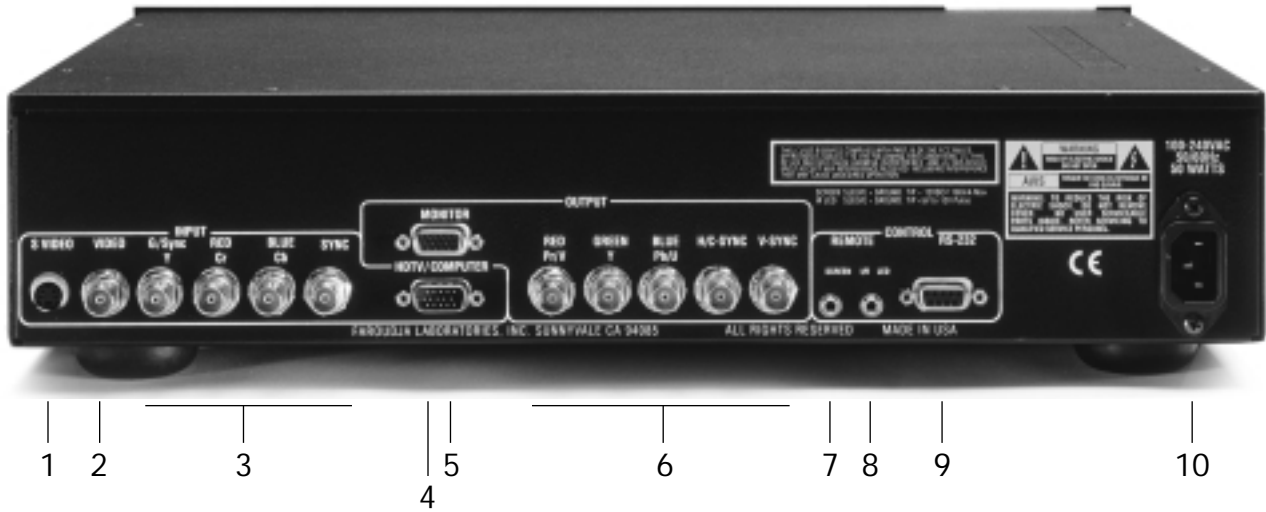
UNPACKING
Remove the NR Series unit from the shipping container and examine it for any signs of shipping damage or missing items (check inventory list below). All shipping materials should be saved if the unit is to be moved or returned for service.

INSTALLATION
The processor can be either placed on a table or rack mounted. If the rack mounting installation kit is used, the rack mount ears are mounted by using 3 screws. It will be necessary to support the rear of the unit if it will be shipped in the rack by using rack support rails supplied by the rack manufacturer.

VENTILATION
The unit uses convection to cool. A fan is not needed. As hot air raises out of the top vent, cool air is drawn in from the bottom. These vents must not be blocked. When rack mounted, a minimum of 1.75″ (1 rack unit height) of free space is required above and below the unit to allow for proper cooling. A forced air fan should be added to the rack installation if power amps are located in the same air space.

REAR PANEL I/O
Inputs
1. S-Video (4 Pin DIN)

2. Composite Video (BNC)

3. Interlaced Component or RGBs Video (BNC)

4. HDTV/Computer (D15M)

10. AC Power

Outputs
5. RGBH/CV or YPrPb (D15F)

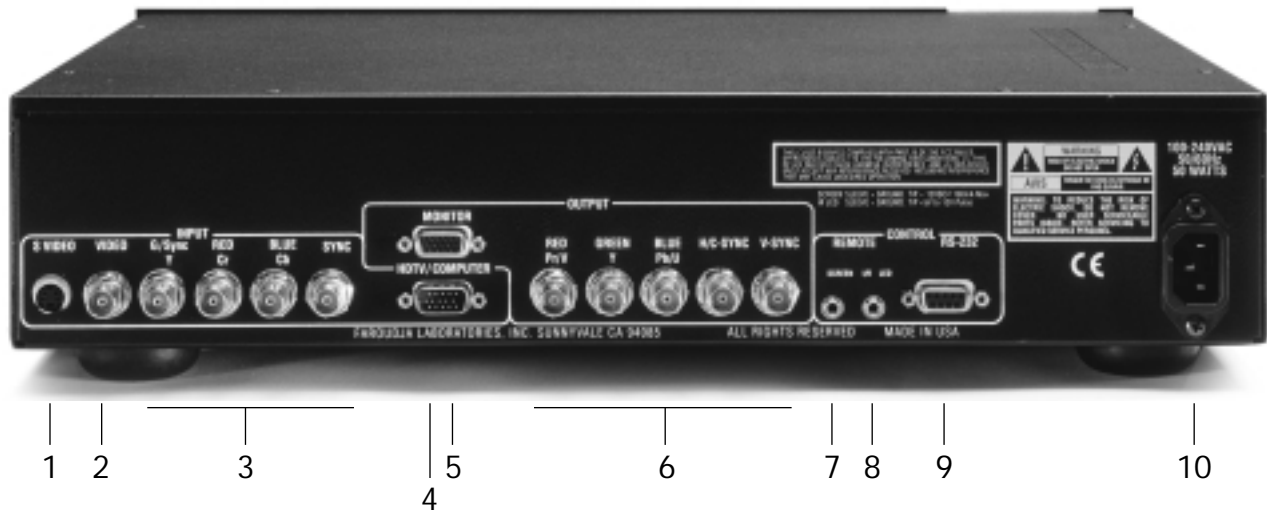6. RGBH/CV, or YPrPb (BNC)

Note: Both outputs can be used simultaneously

Control
7. Screen Trigger (12V, 3.5mm, 2 pin, Tip=+)

8. Remote IR sensor (5V-12V, 3.5mm, Tip=+)

9. RS232 Port (D9F)

Inventory

1-NR Series Unit	1- Remote + Batteries
1-Owner's Manual	1- Warranty Card
1- Power Cord	

CONNECTIONS

Because of the high performance of the NR Series unit it is very important to use the highest quality cables possible, for both input and output signals.

Both the RGB BNC and the D15 Monitor output connections are active at all times and can run two displays simultaneously.

To avoid AC ground loop problems, the source equipment, NR Series unit and projector should all be running on the same grounded AC power line (one rated for the power requirements).

SOURCE INPUTS

1. S-Video (Y/C) sources such as DVDs, Satellite systems, S-VHS tape decks (when using S-VHS tapes only), Hi-8 tape decks.

2. Composite video sources such as Laserdisc players, cable TV, VHS tape decks, 8mm tape decks.

3. Interlaced Component or RGBs video sources such as DVDs and professional cameras.

4. High scan rate sources such as HDTV signals or computers as a pass-through to the projector. YPrPb from HDTV sources can be transcoded to RGBHV on the output.

OUTPUTS

5. D15F connector for use with computer monitors or to a second display device.

6. BNC connectors for main output to display devices. For YPrPb outputs use:

Red =	Pr
Green =	Y
Blue =	Pb

Note: If HDTV or Computer signals are to be used, the projector must have separate H & V sync cables installed.

CONTROL

7. 12V trigger to activate automatic screen relays. Voltage is constant when unit power is on.

8. IR receiver connection allows for use with external IR receivers so unit can be installed behind walls.

9. RS232 D9F connection for use with RS232 control systems

10. AC Power connection.

FRONT PANEL CONTROL

1. **Power/Standby:** Press to turn the unit On (LED turns Green) or to Standby (Red)

2. **Infrared Sensor/Flasher window**

3. **CPU Reset:** push a small paper clip into this opening to reset the unit's CPU.

Note: Do not activate the CPU Reset without first contacting Faroudja technical support or your installer. This will reset all parameters to the factory default and may cause compatibility issues with your setup.

4. **Input Select:** Toggles through the different inputs.

5. **Aspect Ratio Select:** Toggles through the available aspect ratios. If an aspect ratio is not available (LED is not activated), it cannot be selected.

NOTE: Anamorphic with 4:3 screens and the Wide-4:3 settings are not available on units with scan rates 480p,600p and Frame Doubling.

NOTE: Do not leave the 4:3 image with a Wide Angle screen on for long periods of time on a CRT projector. This can cause permanent image burn-in. Image burn-in is not covered by Faroudja's warranty.

6. **LCD Status Display:** Displays scan rate on power-up and the current Function or Value selected.

7. **Function Up/Down :** Cycles up or down through the available control Functions

8. **Value Up/Down :** Adjusts the levels or changes settings of the Function selected.

9. **Custom Presets:** Four presets per input.

10. **Enter:** Press to store presets or to enter menus.

11. **Factory Preset:** Recalls all settings to Factory levels. Pressing once while adjusting a setting will recall that setting back to the factory default. Pressing the **Factory** button twice returns all image settings to the factory default.

Storing User Preset
There are a total of 32 presets that can be stored, four for each input (Composite, S-Video, YCrCb and RGB with separate banks for NTSC and for PAL). Each preset stores all image adjustment functions.

To store a preset:
- Select the proper input.
- Make all required adjustments.

• Press the **Enter** button, the **Preset** LEDs turn Red, the **Enter** LED turns Green. (Press Enter again to cancel procedure)

• Press the **Preset** you want to use and the LED on that **Preset** will turn green and the LED on the **Enter** will go out.

NOTE: When Functions are accessed via the front panel controls the On-Screen-Display is not activated.

SYSTEM SETTINGS AND SETUP

Setup offers functions that must be done when the unit is initially installed. Some user features are not available with a few of the Setup selections so this must be done first. To prevent accidental alteration of the setup parameters, some setup functions can only be done from the front panel or with the RS232 interface.

System Settings - Press Enter
There are four sections to the System Setting:
• System Menu
• User Mode
• I/R Setup
• Test Patterns

System Menu - Press Enter
Pressing the **Function Up** will recall the following commands in this order. Press the **Value Up or Down** key to select or change values. When no commands are entered after a short period the front panel LCD will switch to the main window. Just hit **Function** or **Value** to jump back to the control menu last used.

Exit System Settings- press Enter
Returns to the **User** Menu

RS232 Echo:
 On(Default)/Off
Select if the RS232 commands returns a status report to the control system.

DCDi Mode:
 On (Default)/ Off
Should always be On

Film Mode:
 On (Default)/Off
Should always be On

LCD Display Backlight Timer
 5-255 (Default 10)
Sets how long the front panel LCD stays on.

Red LED Brightness
 0-15 (Default 8)
Front panel LED brightness

Green LED Brightness
 0-15 (Default 8)
Front panel LED brightness

OSD Vertical Position
 0-255(0=Top)
This sets the position of the single line adjustment OSD

OSD Timer
 4-255 seconds (10 Default)
HDTV External Input

Pass-thru
 YPrPb to RGB

NOTE: The HD Pass-through input can transcode YPrPb HDTV signals to RGBHV. It cannot transcode RGBHV signals to YPrPb.

NOTE: Sync on Green is NOT available when using the HD Pass-through input.

The following commands allow for separate settings for each aspect ratio. First select the aspect ratio that needs adjusting before beginning.

It is recommended that sizing and blanking adjustments be done with the display device controls first to insure proper settings before using the following commands.

Bottom Blanking

Right Blanking

Left Blanking

Top Blanking

Image Vertical Position
Moves image up from center

Image Horizontal Position
Moves image left or right of center

Pass RGB Input Sync

Sync on Green
Ext. Sync High/Low
(Low sync is used with PAL sources where composite video is applied as sync with RGB)

Composite Sync on H
On/Off

Sync on Green
On/Off   (Default)
(Comp. Sync on H and Sync on Green Functions are only available if RGB output is selected.)

Output Format
RGB(Default)/YCrCb/YPrPb

Screen Shape
4:3 / Wide / Wide 4:3
• **4:3** – Choose this when the projector is 4:3 and the screen is 4:3
• **Wide** – Choose this when the screen is Widescreen and the projector will provide the anamorphic vertical squeeze.
• **Wide 4:3** – choose this when the projector is 4:3 only and the screen is Widescreen. (Not available on units scanning at rates below 720p)

I/R Setup - Press Enter
Use this section to teach learning remotes the direct access codes. See the IR Setup section on page 10 for details.

Test Patterns-Press Enter
Use these patterns to adjust the image and processor. Use the **Value** key to select the different patterns. Once the pattern is selected press the **Function** key to return to the **User Menu** and then select the proper setup Function. Once adjustment is set, use the **Function** key to return to **Test Patterns - Press Enter** and select **Test Patterns Off**. Accessing the test patterns is easiest using the OSD.
Off
PLUGE
100IRE Window
Active Boarders
Convergence
Blue
Red
Green
Cr Ramp
Cb Ramp
Luma Ramp
10-step Gray Scale
100IRE Rev. CB
100IRE CB

User Mode-Press Enter
These are the controls that are used most often.

Noise Reduction
0-15, Factory 8

Detail
0-31, Factory 8

Tint
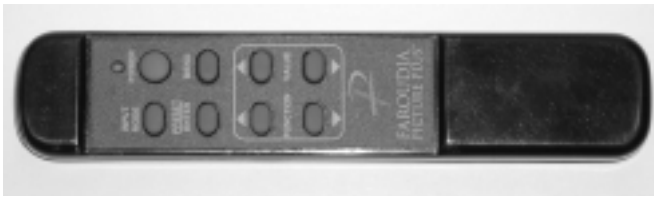0-255, Factory 128

Color
0-255, Factory 128

Contrast
0-155, Factory 128

Brightness
0-170, Factory 128

IR REMOTE AND OSD OPERATION

There are four ways to control the unit: from the front panel, with the remote control buttons, using the On-Screen-Display with the remote and via RS232. Controlling from the front panel or the remote requires cycling through the available functions. If direct access IR control is needed, the unit can teach learning remotes via the IR flasher. See the IR Setup section.

When the unit first powers up it will go through an initializing procedure and then display the output resolution.

The remote control allows for easy operation by simple navigation through the On Screen Display (OSD)menus. Repeated Pressing of a button toggles through the available choices.

Power On/Off: Press Power
Select Presets: Press Preset
Select Input: Press Input Mode
Select Aspect Ratio: Press Aspect Ratio
Select OSD Functions: Press Function
Change Value: Press Value

On Screen Display

Control of most functions can be done using the remote to interact with the OSD.

Accessing the OSD
• Press **Menu** button to bring up main Index.

• Use **Function** keys to select an index and the available control menu drops down.

• Press **Function** again to select an adjustment.

• Use **Value** to adjust. The main menu drops away and a single line menu appears.

• Use the **Function** keys return to the drop down menu.

• Press **Menu t**o recall the main index.

• Press **Menu** again to remove OSD

The OSD consists of four index tabs:

INPUT	PICTURE	DISPLAY	PATTERNS

The Functions available for each index are listed below:

INPUT

Formats
> **Input Select:**
> Video-S-Video-YCrCb-RGB-PassThru
> **Aspect Ratio***
> 4:3-Letterbox-Anamorphic

Presets-
> **Recall:** Factory-1-2-3-4
> **Store:** 1-2-3-4

To store a preset:
> • Select the proper input.
> • Make all required adjustments.
> • Use the **Function** keys to select S**tore 1 2 3 4.**
> • Use the **Value** keys to select the desired preset
> • Press **Enter**

*Aspect Ratio Selection
Press the Aspect Ratio button to toggle between the different choices. The aspect ratio selected needs to match the aspect ratio of the source.

NOTE: When using a Wide Angle screen a 4:3 source will have black bars on the left and right of the image. If filling the entire screen is desired, select Letterbox. The image will fill the screen but the top and bottom 1/3 of the image will be cut off.

Anamorphic on a 4:3 screen is not available on units with scan rates below 720p.

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PICTURE

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Use these commands to fine tune the image
      Brightness
      Contrast
      Tint
      Color
      Detail
      Noise Reduction

NOTE: Adjusting Detail – The Detail and Noise Reduction settings have been optimized for the scan rate and resolution of the NR Series for most sources. However, the viewers tastes and the types of software used may require making adjustments of these settings to fine tune the image. Theses controls are very effective to either increase detail or to help clean up poor quality video material. It is recommended that adjustments be made in small increments until the desired results are achieved. It is important to not use too much Detail as the image will start to look artificial.

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DISPLAY

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Use these commands to adjust the image position and edge blanking. It is recommended to adjust sizing and blanking in the display device <u>first</u>. This should be done by a qualified technician.

Position
      Horizontal
      Vertical
Blanking
      Left
      Right
      Top
      Bottom

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PATTERNS

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These patterns are used to setup and align the image. This should be done by a qualified technician only.

Pattern
      On/Off
Select

Off	Cr Ramp
PLUGE	Cb Ramp
100IRE Window	Luma Ramp
Active Boarders	10-step Gray Scale
Convergence	100IRE Rev. CB
Blue	100IRE CB
Red	
Green	

RS232 CONTROL
Connector: DB-9 Female

Baud rate: 9600 default, 8 bit,
1 stop bit and No Parity
(Adjustable 4800, 9600, 19,200)

Pin Configuration:
Pin 5 = Ground
Pin 3 = Rx
Pin 2 = Tx

All commands are sent using ASCII text strings.

NOTE: A command must start with the string header "NRS"

Following the header, a comma is used to delimit the header from the command. All the commands with their descriptions will be listed below. All the text strings are terminated with a carriage return (0x13). The header and command are not case sensitive.

Since the picture settings are Input specific, the input to be used, i.e. Video, Y/C or YPrPb, must be selected first before adjusting and storing settings.

EXAMPLE: NRS,x,b128,C175,K128,N10,d6 (0x13 or cr)

COMMAND	FUNCTION	COMMAND	FUNCTION
HELP	Display Help Menu	ST	SYSTEM SETUP Report Current Status
ON	Power ON	E#	ECHO 0=Off, 1=On
OFF	Power OFF	W#	Screen Shape, (0=Wide, 1=4x3, 2=Wide-4:3)
		CS#	Comp Sync 0=Off, 1=On
	INPUTS	G#	Sync on Green 0=Off, 1=On
V	Video Input	M#	Output Mode (0-2) (0=RGB, 1=YCrCb, 2=YPrPb)
Y	S-Video Input	CS#	Comp Sync 0=Off, 1=On
X	YCrCb		
R	RGBS	OSD#	Vertical Position (0-255) (Default 128)
EXT	Pass-Thru Input	OSD#	OSD 0=Off, 1=On
	IMAGE CONTROL		
B#	Brightness (0-255) (Factory 128)	OSDT#	OSD Timer (4-255) (Default 10)
C#	Contrast (0-255) (Factory 128)	P#	Pass-Thru R=Pass-Thru, Y=Transcode
T#	Tint (0-255) (Factory 128)	TP#	Internal test Pattern 0=Off 1=CB 2=Grayscale 3=Convergence 4=Luma Ramp 5=Window
K#	Color (0-255) (Factory 128)	IR#	IR Receiver 0=Off
D#	Detail (0-15) (Factory 8)		
N#	Noise Reduction (0-15) (Factory 8)		
A#	Input Aspect Ratio (0-2) (0=4x3, 1=Letterbox, 2=Anamorphic)		
L#	Store User Preset (1-4)		
P#	Recall Preset (0-4) (1-4=User, 0=Factory)		

IR REMOTE TEACHING FUNCTIONS

Use the Function key to locate IR Setup Menu-Press Enter. Use the Value key to select the different commands. Each time the Enter button is pressed it "flashes" the commands out through the IR receiver window on the front panel.

	IR COMMAND
1	POWER ON
2	POWER OFF
3	VIDEO
4	S-VIDEO
5	RGB
6	YCrCb
7	PASS-THRU
8	ASPECT RATIO
9	BRIGHTNESS
10	CONTRAST
11	COLOR
12	TINT
13	NOISE REDUCTION
14	DETAIL
15	FUNCTION UP
16	FUNCTION DOWN
17	VALUE UP
18	VALUE DOWN
19	PRESET / ENTER
20	FACTORY
21	INPUT
22	MENU
23	0
24	1
25	2
26	3
27	4
28	5
29	6
30	7
31	8
32	9

Inputs (Interlaced)	
Format NTSC/PAL	Auto Detect
Composite(BNC)	1vpp
S-Video	Y - 1v pp C -286mv pp
Component (SMPTE)(BNC)	Y—1vpp Cr—700mv pp Cb - 700mv pp
RGB	Comp. Sync—1vpp RGB-700mv pp
HD/PC Pass-Thru	D15M
Remote Control "D9F"	RS-232 ASCII
Outputs (Progressive)	
R,G,B (BNC or DB15)	700mv pp, TTL Sync
YprPb	700mv pp, Sync on Y-1vpp
RGsB	Gs - 1vpp RGB - 700mv pp

D15F	Pin Function
	  1 Red Out
	  2 Green Out
	  3 Blue Out
	  7 Red Gnd
	  8 Green Gnd
	  9 Blue Gnd
	10 Sync Gnd
	11 Sync Gnd
	13 H Sync Out
	14 V Sync Out

Horizontal Sync:	**NTSC:** 31.5KHz, 37.7KHz, 45KHz, or 48KHz- depending on model **NTSC:** 63KHz - Native Rate Series Plus only **PAL:** 31.2KHz, 37KHz, 40KHz - depending on model **PAL:** 53KHz - Native Rate Series Plus only 4.0 vpp TTL
Vertical Sync:	60Hz/50Hz, 4.0 vpp TTL
Composite Sync :	4.0 vpp TTL
Dimensions	13D X 17.25W X 4.24H (with feet) (Depth includes rear BNC)
Weight	15lbs, 20lbs shipping
Power Consumption	24w with 120v, 33w with 220v
Power Supply	100-240VAC 50/60Hz Auto Ranging

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